

Name: _____

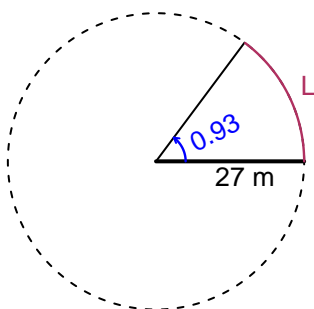
Date: _____

Trig Final (TEST v662)

- You can use a calculator (like [Desmos](#))
- You should have a unit-circle with special angles and coordinates marked.

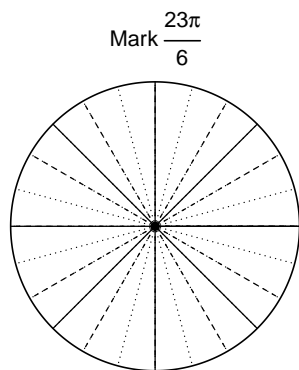
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The radius is 27 meters. The angle measure is 0.93 radians. How long is the arc in meters?

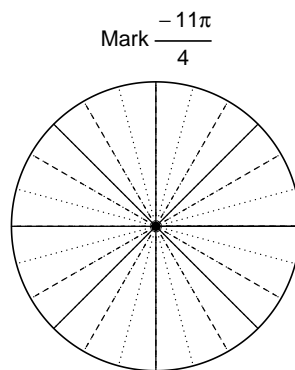


Question 2

Consider angles $\frac{23\pi}{6}$ and $\frac{-11\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\cos\left(\frac{23\pi}{6}\right)$ and $\sin\left(\frac{-11\pi}{4}\right)$ by using a unit circle (provided separately).



Find $\cos(23\pi/6)$



Find $\sin(-11\pi/4)$

Question 3

If $\tan(\theta) = \frac{-80}{39}$, and θ is in quadrant IV, determine an exact value for $\cos(\theta)$.

Question 4

A mass-spring system oscillates vertically with a frequency of 5.46 Hz, an amplitude of 7.78 meters, and a midline at $y = 3.44$ meters. At $t = 0$, the mass is at the midline and moving down. Write an equation to model the height (y in meters) as a function of time (t in seconds).